

We claim:

1. An optical transmitter for generating optically labeled packets comprising:

a phase modulator driven by a payload signal to provide DPSK modulation of a payload portion of optically labeled packets; and

5 an intensity modulator coupled to the phase modulator, the intensity modulator being driven by a label signal to provide ASK modulation of a label portion of optically labeled packets.

2. The transmitter of claim 1 wherein the phase modulator and the intensity modulator are modulators selected from the group consisting of a Mach-Zehnder modulator, a  
10 single-waveguide modulator or an electro-absorption modulator.

3. The transmitter of claim 1 wherein the payload signal is a high speed signal having a data rate of greater than about 2.5Gb/s and the label signal is a low speed signal having a data rate of less than about 1/4 of the data rate of the payload signal.

4. The transmitter of claim 1 wherein the extinction ratio of the ASK modulation is  
15 between about 2 dB and about 8 dB.

5. The transmitter of claim 1 further comprising a differential encoder coupled to the phase modulator.

6. A system comprising:

a transmitter for generating optically labeled packets, the transmitter including  
20 a phase modulator driven by a payload signal to provide DPSK modulation of a payload portion of the optically labeled packets; and

an intensity modulator coupled to the phase modulator, the intensity modulator being driven by a label signal to provide ASK modulation of a label portion of the optically labeled packets.

7. The system of claim 6 further comprising a receiver including a balanced detector  
5 for detection of the DPSK modulated payload portion of the optically labeled packets.
8. The system of claim 6 further comprising a wavelength converter for providing wavelength conversion of the optically labeled packets using a four-wave-mixing process while maintaining the phase and amplitude of the optically labeled packets.
9. The system of claim 6 further comprising a label processor adapted to provide label  
10 insertion, label removal and/or label reading.
10. A system for transmission of optically labeled packets comprising:
  - a transmitter including at least two modulators adapted to provide DPSK modulation of a payload portion of optically labeled packets and ASK modulation for a label portion of the optically labeled packets; and
  - 15 a receiver including a balanced detector for detection of the payload portion of the optically labeled packets.
11. A communication method for transmission of optically labeled packets comprising the step of:
  - modulating light from a laser source using DPSK modulation to carry payload  
20 information and ASK modulation to carry label information.
12. The method of claim 11 further comprising receiving the optically labeled packets using a balanced detector to detect the payload portion of the optically labeled packets.

13. The method of claim 11 wherein modulating the light from the laser source is performed using a phase modulator and an intensity modulator, the modulators selected from the group consisting of a Mach-Zehnder modulator, a single-waveguide modulator or an electro-absorption modulator.

5 14. The method of claim 11 wherein the payload of the optically labeled packets contains high speed data at a data rate of greater than about 2.5Gb/s, and the label contains low speed data at a data rate of less than about 1/4 of the data rate of the payload.

10 15. The method of claim 11 wherein the extinction ratio of the ASK modulation is between about 2 dB and about 8 dB.

16. The method of claim 11 further comprising providing pulse generation to allow for generation of RZ DPSK payload signals.

17. An optical transmitter comprising:

15 a first modulator means driven by a payload signal to provide DPSK modulation of a payload portion of optically labeled packets; and an second modulator means coupled to the first modulator means, the second modulator means being driven by a label signal to provide ASK modulation of a label portion of optically labeled packets.

18. A communication system for transmission of optically labeled packets comprising:  
20 means for modulating light from a laser source using DPSK modulation to carry payload information and ASK modulation to carry label information.